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(56) Documents Cited

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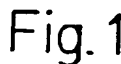
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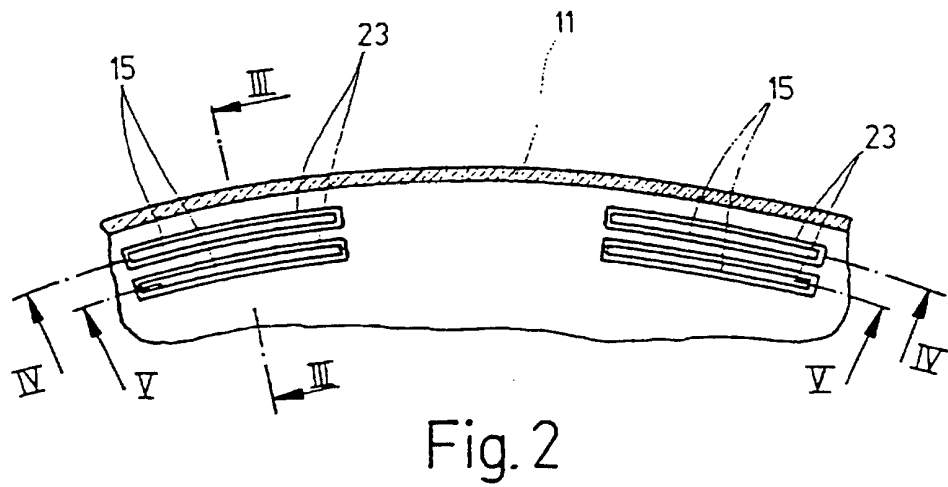
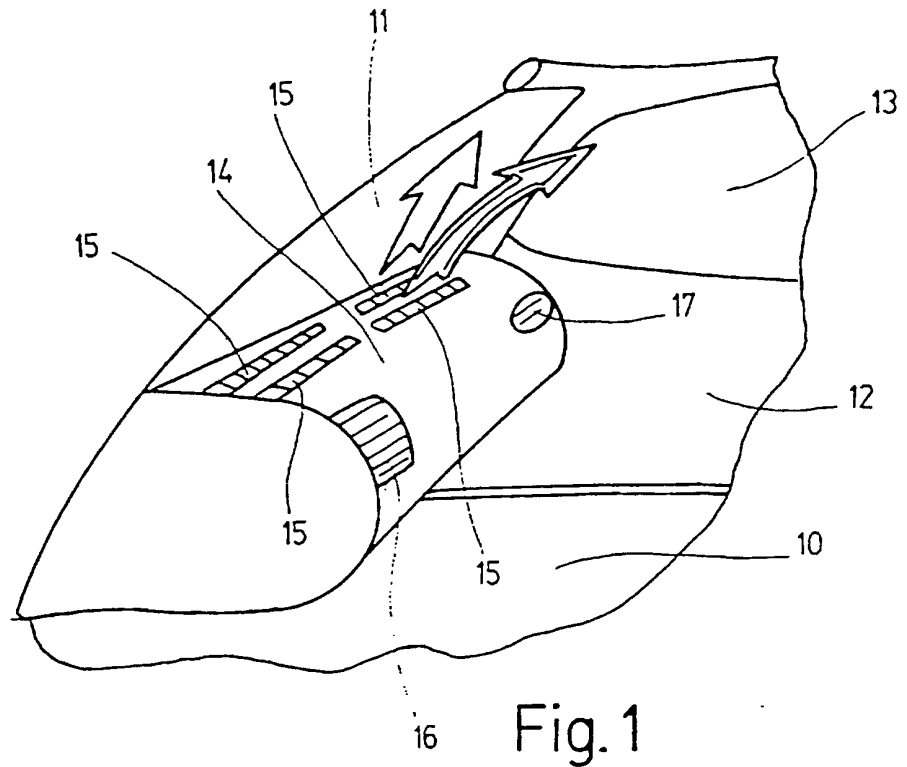
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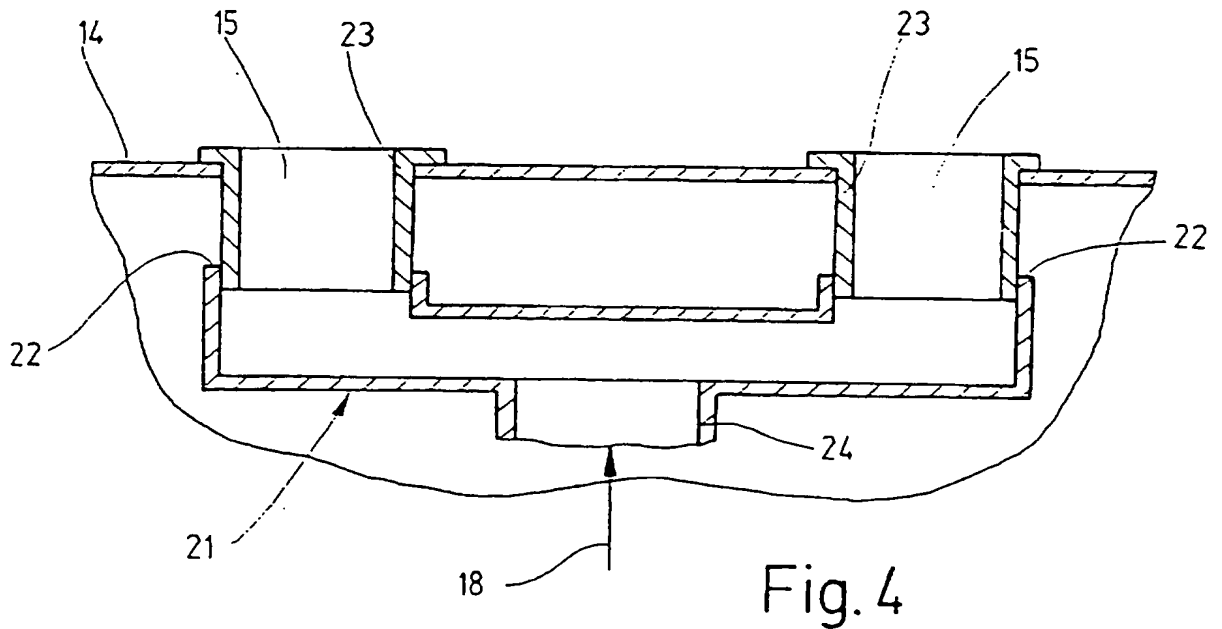
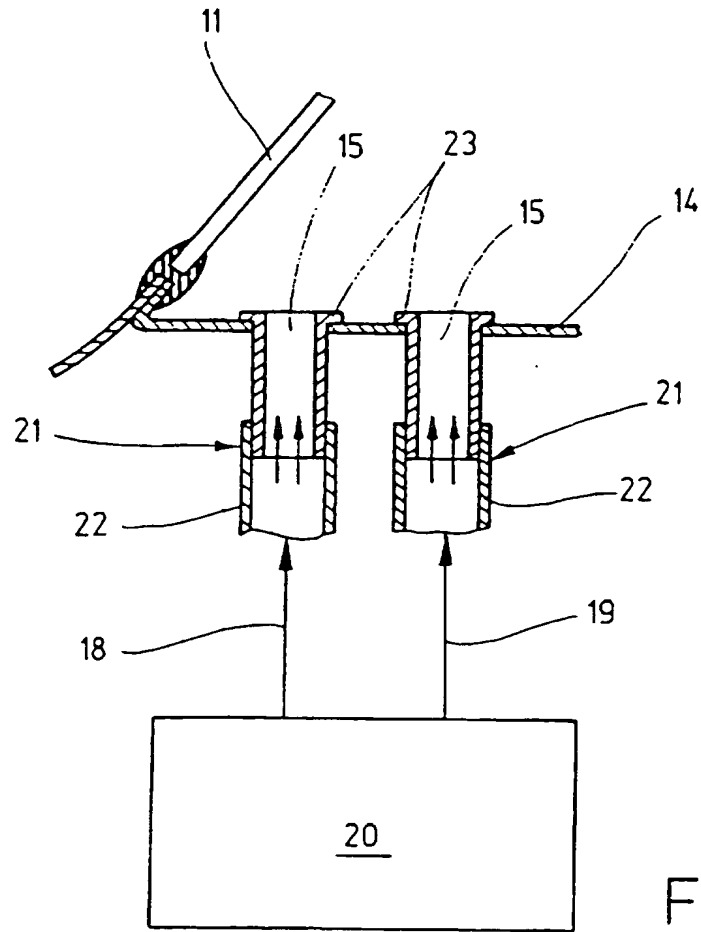
Ventilation device for vehicles

(57) A ventilation device for an interior 10 of a vehicle fitted with a windscreen 11 and dashboard 14, which device has a plurality of air exit openings 15 which are left open in the dashboard 14 in the vicinity of the windscreen 11 and are arranged next to one another in two rows lying one behind the other, as seen in the direction of travel. In order to ensure that a large windscreen is free from misting without the air-conditioning comfort in the interior being adversely affected, each row of air exit openings 15 is connected to one of two separate supply ducts 18, 19, and the air supply duct 18 leading to the front row is charged with hot air warmed up to a higher degree than the air supply duct 19 leading to the rear row.



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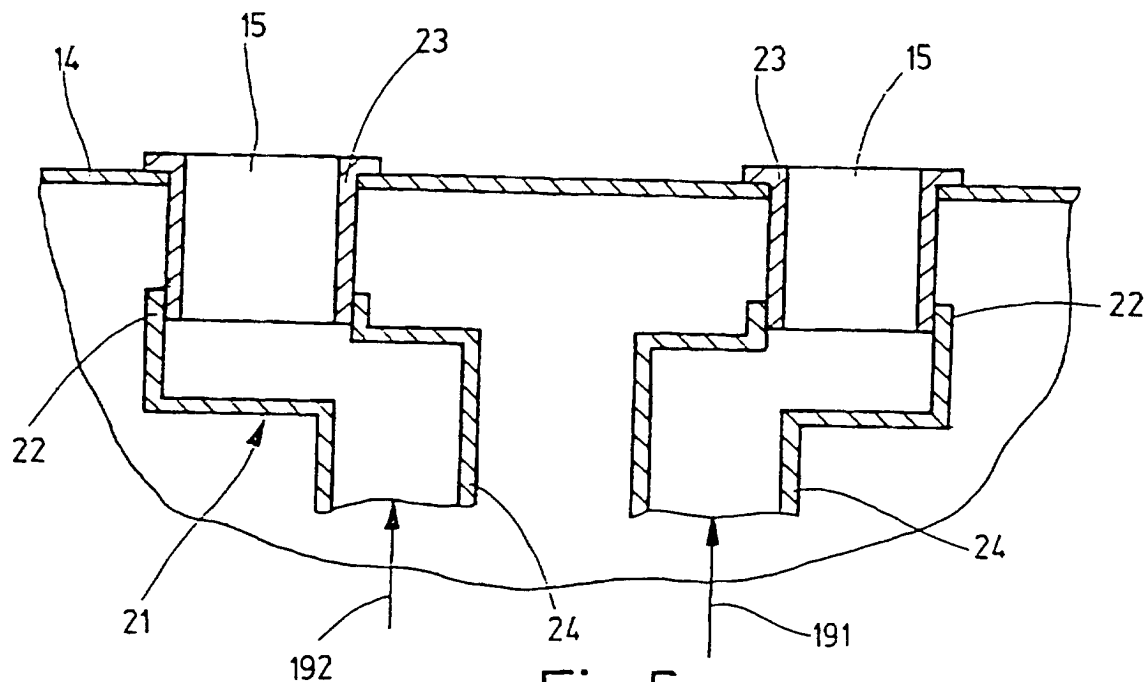


Fig. 5

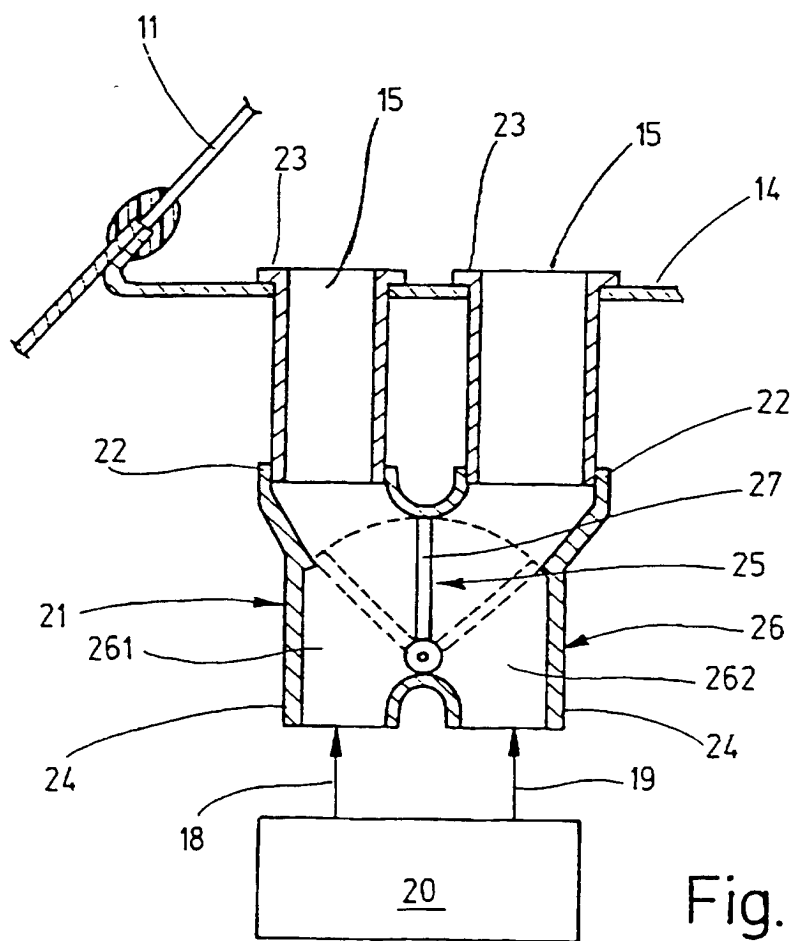


Fig. 6

Ventilation device for vehicles

The invention relates to a ventilation device for an interior of a vehicle fitted with a windscreen and dashboard, the device having a plurality of air exit openings which are open in the dashboard in the vicinity of the windscreen and are arranged next to one another in two rows lying one behind the other, as seen in the direction of travel.

In the case of a known ventilation device of this type (US 3 608 469), the air exit openings serve as defroster nozzles for keeping the windscreen demisted and are connected to a common hot-air duct. Because the hot air is blown out in a spaced apart manner, in the exit region of two air openings arranged one behind the other there form vortices and dynamic negative pressure zones which bunch up the two separate air flows to form a narrow flow which blows in a targeted manner against the windscreen, thereby intensifying the effect of removing the moisture and keeping the windscreen demisted.

Because windscreens in modern cars are arranged in an increasingly flatter manner, the height or length of the windscreens is also becoming continuously larger. The greater lengths causes the air brushing against the windscreen to cool more strongly. In order to ensure that the windscreen is kept demisted, when the ambient temperature is cool air of a relatively high temperature has to be blown out at the air exit openings. This highly heated air also flows into the air space above the dashboard to the passengers' heads. However, to give air-conditioning comfort in the interior, the aim is for a hot footwell and a cool upper air space around the head.

The present invention seeks to provide a ventilation device of the type mentioned at the beginning which firstly keeps large windscreens reliably demisted and secondly ensures the usual air-conditioning comfort in the interior.

According to the present invention there is provided a ventilation device for an interior of a vehicle fitted with a windscreen and dashboard, the device having a plurality of air exit openings which are open in the dashboard in the vicinity of the windscreen and are arranged next to one another in two rows lying one behind the other, as seen in the direction of travel, wherein each row of air exit openings is connected to one of two separate air supply ducts, and the air supply duct leading to the front row is charged with hot air at a higher temperature than the air supply duct leading to the rear row.

The ventilation device according to the invention has the advantage that the air which is heated up to a higher degree and comes from the front air exit openings lying in the vicinity of the windscreen is placed against the windscreen as a hot-air film and ensures its freedom from misting, while the cooler air flow from the rear air exit openings lying closer to the vehicle occupants passes into the upper air space and sets the desired air-conditioning comfort here.

Advantageous embodiments of the ventilation device according to the invention with expedient refinements and developments of the invention emerge from the other patent claims.

The invention is described in more detail below with reference to an embodiment illustrated in the drawing in which, in each case in schematic representation: Fig. 1 shows part of a perspective illustration of the front region of an interior of a car having a windscreen and dashboard arranged below it, Fig. 2 shows part of a plan view of the dashboard in Fig. 1, Fig. 3 shows part of a section along the line III-III in Fig. 2, Fig. 4 shows part of a section along the line IV-IV in Fig. 2, Fig. 5 shows part of a section along the line V-V in Fig. 2, and Fig. 6 shows an identical representation to the one in Fig. 3 with an air-distributing guide in the air supply.

In Fig. 1, part of the front region of an interior 10 or of a passenger cell of a car is represented schematically. As is known, the interior 10 is closed off at the front end by a windscreen 11 and at the sides by vehicle doors 12 having side windows 13. Below the windscreen 11 there is arranged a dashboard 14 which extends along the lower edge of the windscreen 11 over the entire width of the interior 10. A ventilation device for the interior 10 has a plurality of air exit openings 15 left open in the dashboard 14 in the vicinity of the windscreen 11, and also further air nozzles 16 and 17 inserted into the dashboard 14. The said air nozzles are known as central nozzles 16 and side nozzles 17.

The air exit openings 15 are arranged next to one another in two rows lying one behind the other, as seen in the direction of travel, there being at least two air exit openings 15 in each row (Fig. 2). As the sectional representations in Figs. 3 to 5 show, the at least two air exit openings 15 of one row are in each case connected to one of two separate air supply ducts 18, 19 which lead to the air-conditioning box 20 of an air-conditioning system and can be charged therewith air warmed up to different

temperatures. Each of the air supply ducts 18 and 19 are respectively connected to the associated air exit openings 15 in the front and rear rows by, for example, a cup-shaped distributor piece 21 (Figs. 3-5) which by at least two outlet connecting stubs 22 is placed in an airtight manner onto nozzle housings 23 which, for their part, are inserted into each of the air exit openings 15 from the upper side of the dashboard 14. The end of the air supply duct 18 or 19 is pushed onto an inlet connecting stub 24, which is integrally formed on the distributor piece 21. For the sake of simplicity, the air-guiding ducts 18, 19 between the distributor pieces 21 and the air-conditioning box 20 are symbolized by arrows.

Via an air distributor in the air-conditioning box 20 the air supply duct 18 is charged with strongly heated-up air which flows out via the air exit openings 15 in the front row lying in the vicinity of the windscreen 11 and positions itself against the windscreen 11 as a hot-air film. This hot-air film of relatively high temperature ensures that even a particularly large windscreen 11 is free from misting. In contrast, the air supply duct 19 is charged with air which is warmed up under conditions of comfort and flows via the air exit openings 15, lying closer to the passengers, in the rear row into the vehicle space above the dashboard 14 where it passes into the region around the passengers' heads. This warmed air flow on the one hand supplies the head region of the interior 10 with air which is warmed up under conditions of comfort and which is customarily cooler than the air flowing into the footwell of the interior 10 and therefore ensures good air-conditioning comfort for the passengers, and on the other hand prevents the highly heated-up hot-air film on the windscreen 11 from flowing, for its part, directly to the region around the passengers' heads.

Since from the point of view of comfort the supply of air to the passenger cell takes place separately for the driver side and front-passenger side of the vehicle interior, the air supply duct 19 - as is shown in Fig. 5 - is divided up into two separate ducts 191 and 192 which are guided to in each case one inlet connecting stub 24 of the distributor piece 21. Each inlet connecting stub 24 is connected to at least one outlet connecting stub 22 into which a respective nozzle housing 23 for the left and right vehicle sides is inserted. In contrast, the air supply of the strongly heated air to the windscreen 11 does not need to be separated and so there is only a single air supply duct 18, as can be seen in the sectional representation of Fig. 4.

In the modified ventilation device according to Fig. 6, where the air exit openings 15 are connected to the air supply ducts 18 and 19 an air-distributing guide 25 is arranged in such a manner that in addition all of the air exit openings 15 can be connected alternately to one or other air supply duct 18 or 19. For this purpose, the air-distributing guide 25 has a Y-pipe 26 whose two Y-legs 261, 262 produce the connection between the front and rear rows of the air exit openings 15 and one of the air supply ducts 18 and 19 in each case. An air flap 27 is arranged pivotably in the centre of the Y-pipe 26, specifically in such a manner that in its central basic position it separates the Y-legs 261, 262 from each other, and in its two pivoted end positions (shown by dashed lines in Fig. 6) alternately connects the two rows of the two air exit openings 15 to one or the other air supply duct 18 or 19. In the left pivoted end position (shown by dashed lines in Fig. 6) of the pivoting flap 27, the connecting stub 24, which is connected to the air supply duct 18, is shut off and all of the air exit openings 15 are connected to the air supply duct 19 for the warmed-up supply of air, while in the right pivoted end position (shown by dashed lines in Fig. 6) of the air flap 27 the inlet connecting stub 24, which is connected to the air supply duct 19, is shut off and all of the air exit openings 15 are connected to the air supply duct 18 conducting the air heated up to a higher degree. The pivoting flap 27 can be activated manually or by an automatic adjustment means.

Alternatively, the air exit openings lying in each row can be combined to form a continuous slot which extends over the entire width of the dashboard 14, it being possible for each slot to be covered by a decorative grate.

Claims

1. A ventilation device for an interior of a vehicle fitted with a windscreen and dashboard, the device having a plurality of air exit openings which are open in the dashboard in the vicinity of the windscreen and are arranged next to one another in two rows lying one behind the other, as seen in the direction of travel, wherein each row of air exit openings is connected to one of two separate air supply ducts, and the air supply duct leading to the front row is charged with hot air at a higher temperature than the air supply duct leading to the rear row.
2. A ventilation device according to Claim 1, wherein the air supply ducts are connected to the air-conditioning box of an air-conditioning system, and the air flowing in the air supply duct leading to the rear row of the air exit openings is warmed up under conditions of comfort, and the air flowing in the air supply duct leading to the front row of the air exit openings is heated up strongly.
3. A ventilation device according to Claim 1 or 2, wherein the air exit openings of each row are combined to form a continuous slot.
4. A ventilation device according to Claim 1 or 2, wherein the air supply duct leading to the rear row of air exit openings is divided up, in order separately to supply the right and left sides of the vehicle interior with air, into two separate air ducts each of which is connected to at least one air exit opening in the right and left halves of the dashboard in the rear row.
5. A ventilation device for an interior of a vehicle fitted with a windscreen and dashboard, the device having a plurality of air exit openings which are open in the dashboard in the vicinity of the windscreen and are arranged next to one another in two rows lying one behind the other, as seen in the direction of travel, wherein the air exit openings in the front and rear rows are connected via a switchable air-distributing guide to two air supply ducts respectively charged with hot air warmed up to a higher and lower temperature, and the air-distributing guide is designed in such a manner that in a basic position of the air-distributing guide the air exit openings of the front row are

connected to the air supply duct charged with hot air warmed up to a higher degree, and the air exit openings of the rear row are connected to the air supply duct charged with hot air warmed up to a lower degree, and in two switch-over positions of the air-distributing guide in each case all of the air exit openings can be connected alternately to one or other air supply duct .

6. A ventilation device according to Claim 5, wherein the air-distributing guide has a Y-pipe whose two Y-legs produce the connection between the front and rear rows of the air exit openings and one of the air supply ducts in each case, and has an air flap which is arranged pivotably and centrally in the Y-pipe and in its central basic position separates the Y-legs from each other and in its two pivoted end positions alternately connects the two rows of the air exit openings to one or the other air supply duct.

7. A ventilation device for an interior of a vehicle fitted with a windscreen and dashboard, substantially as described herein with reference to, and as illustrated in, the accompanying drawings.



Application No: GB 0000866.4
Claims searched: All

Examiner: Paul Gavin
Date of search: 24 March 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.R): B7B(BPC, BPD), F4V(VCF, VGBB, VGBE)
Int CI (Ed.7): B60H(1/24,34)
Other: Online : WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2 139 749 A (HONDA) - Consider whole document	1 & 5 at least
X	GB 1 040 469 (PININFARINA) - Consider whole doc.	1 & 5 at least
X	EP 0 713 792 A1 (FIAT) - Consider whole document	1 & 5 at least
X	FR 2 623 776 A1 (RENAULT) - Consider abstract & figures.	1 & 5 at least
X	FR 2 608 520 A1 (CHAUSSON) - Consider abstract & figures.	1 & 5 at least
X	US 4 223 754 (HONDA) - Consider whole document	1 & 5 at least

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